Climate Change Adaptation Advisory Committee

Overview for the Massachusetts Legislature on Climate Change Adaptation

Presentation Title: Presentation by the members of the Climate Change Adaptation Advisory Group

Presentation by the Coastal Zones and Oceans Subcommittee

Date of Presentation: 28 October 2009

The following presentation is offered for discussion purposes only and does not necessarily represent current statute, regulation, or policy positions of the Commonwealth of Massachusetts unless specifically acknowledged.

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CLIMATE CHANGE ADAPTATION

COASTAL ZONE and OCEANS

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KEY SECTORS REVIEWED

- Coastal habitats/resources/services
- Ocean habitats/resources/services
- Public structures and critical facilities
- Residential and commercial development
- Ports and harbors
- Public access, recreation, and tourism

KEY VULNERABILITIES

- **Sea-level rise and flooding**
  - Loss of beach and estuarine habitat due to drowning and barrier migration
  - Degradation of freshwater drinking supplies through saltwater intrusion into aquifers
  - Damage to public and private development, infrastructure, critical facilities and port assets
- **Physical ocean conditions (temperature, pH, salinity, currents)**
  - Changes in range and distribution of species
  - Shifts in coastal and marine habitats
  - Risks to **commercial fishing** and aquaculture from new stress, diseases and pathogens
- **Precipitation**
  - Increased polluted **runoff** and **combined sewer overflow** events with negative effects on estuarine and marine water quality, resources, human health, and economies
- **Extreme weather events**
  - Increased risks to **development** in vulnerable floodplains and along shorelines
  - Increased **damage** to development, infrastructure, critical facilities and port assets
- **Other**
  - Decreased public access, recreational opportunities and tourism revenue due to **beach erosion** and loss of waterfront
  - Increased harmful **algal blooms** and human health effects

KEY FINDINGS

- **Enough now known to act, but continue to build on existing knowledge base**
  - Range of sea level rise projections
  - Causes of uncertainty
  - Need to fill critical gaps and improve risk identification

- **Prioritize where protection should be advanced and where managed retreat is more prudent**
  - Pressure for policy & criteria to increase
  - Dense urban harbors v. less developed areas
  - Limited resources will constrain choices

KEY FINDINGS

- **Intensify efforts to reduce stress on natural systems and increase resiliency**
  - Most appropriate in non-urban areas
  - Essential for marine resources and coastal habitat
- **Integrate flexible practices into resource management that address cumulative impacts**
  - Monitoring is key
  - Existing base is good – build on it

THE FUTURE IS HERE!
High tide July 09: Central and Long Wharfs

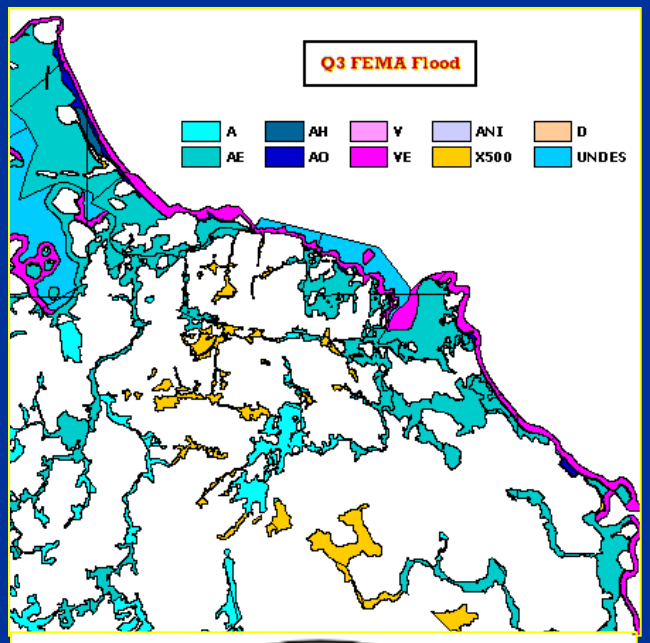
DRAFT STRATEGIES

Potential Strategy #1: RESIDENTIAL and COMMERCIAL DEVELOPMENT, PORTS and INFRASTRUCTURE

- **Site <u>new</u> development outside of projected high-risk and future resource areas**
  - Delineate high-hazard zones using projected sea level rates
  - Consider risks over full project life
  - Use regulatory and policy tools to direct development out of high-risk areas:
    - Executive Order
    - MEPA, Ch 91, Wetlands Protection Act
  - More evaluation of market mechanisms needed – especially role of insurance

Potential Strategy #1 (cont'd)

- **Decrease risk and repetitive losses to <u>existing</u> development**
  - Expand State Building Code elevation and other requirements ("A" zones)
  - Acquire and protect high-risk land in fee and through conservation restrictions
  - Direct redevelopment out of high-risk areas using tools such as Transfer of Development Rights or rolling easements



Potential Strategy #1 (cont'd)

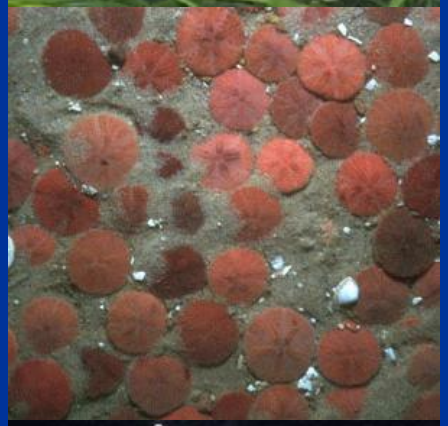
- **Evaluate and update hazard mitigation, evacuation, and emergency response plans**
  - Increased frequency of high risk hazards
  - Less time for recovery and preparation
  - Increasing scale of effort needed

Potential Strategy #2: COASTAL ENGINEERING for SHORELINE STABILIZATION and FLOOD PROTECTION

- **Improve assessment of erosion and flooding and evaluation of design and placement of engineered approaches**
  - Advance “soft” engineering for sediment supply
  - Analyze new & replacement hard structures (seawalls, revetments…)
  - Develop sand mining policy to guide use of Commonwealth submerged resources
  - Prioritize placement of sediment on public beaches
  - Use local conditions and sea level rise

Potential Strategy #3:
HABITATS, RESOURCES and ECOSYSTEM SERVICES

- **Improve resiliency of natural habitats, communities, and populations**
  - Land conservation
  - Habitat restoration
  - "Green infrastructure"
- **Reduce anthropogenic stressors through directed improvements in estuarine and marine water quality**
- **Fisheries management systems need ecosystem-based approaches and flexibility in tools (quotas, catch-shares, etc.) to ensure that targets are realistic, achievable, and avoid unnecessary burdens on recreational and commercial fisheries**



Potential Strategy #3 (cont'd)

- **Improve shellfish management and aquaculture w/ better predictions of HABs, marine pathogens, and rainfall**
- **Increase estuarine and marine monitoring, observations, and assessments to ensure that:**
  - Adequate capabilities exist to provide sustained, high-resolution measurements at key locations
  - Biological surveys and assessments support increased understanding of changing ecosystem processes
  - Models can be developed to run scenarios of future conditions and test hypotheses

Thank you

Questions?